

WHAT IS CLAIMED IS:

1. A plasma CVD apparatus comprising an anode electrode and a cathode electrode, which is for forming a thin film on a substrate by performing plasma discharge between the anode electrode and the cathode electrode, comprising:

a substrate holder disposed between the anode electrode and the cathode electrode; and

one conductive member disposed between the substrate holder and one electrode of either the anode electrode or the cathode electrode, wherein

the substrate holder supports the substrate,

the one conductive member is provided between the one electrode and the substrate holder so as to substantially cover an entire space between the one electrode and the substrate holder, and

the one conductive member is electrically connected to the one electrode and the substrate holder.

2. A plasma CVD apparatus according to claim 1, wherein shapes of the anode electrode and the cathode electrode are plate-like shapes.

3. A plasma CVD apparatus according to claim 1, wherein

plasma discharge is performed between the anode electrode and the cathode electrode by applying a voltage between the anode electrode and the cathode electrode with a raw material gas supplied between the anode electrode and the cathode electrode.

4. A plasma CVD apparatus according to claim 1, wherein:

the one conductive member includes a supporting plate provided substantially parallel to the one electrode and a plurality of conductive plates provided on an upper surface and a lower surface of the supporting plate;

the upper surface of the supporting plate is a surface of the supporting plate opposing the substrate holder;

the lower surface of the supporting plate is a surface of the supporting plate opposing the one electrode;

the plurality of the conductive plates provided on the upper surface of the supporting plate are in contact with the substrate holder;

the plurality of the conductive plates provided on the lower surface of the supporting plate are in contact with the one electrode;

the shapes of the plurality of the conductive plates provided on the upper surface and the lower surface of

the supporting plate are leaf-spring shapes;

the plurality of conductive plates are provided on the upper surface and the lower surface of the supporting plate by attaching one edge of each of the plurality of conductive plates to the supporting plate; and

the other edge of each of the plurality of the conductive plates is spaced from the supporting plate.

5. A plasma CVD apparatus according to claim 1, wherein:

the one conductive member includes a supporting plate provided substantially parallel to the one electrode and a plurality of conductive plates provided on an upper surface and a lower surface of the supporting plate;

the upper surface of the supporting plate is a surface of the supporting plate opposing the substrate holder;

the lower surface of the supporting plate is a surface of the supporting plate opposing the one electrode;

the plurality of the conductive plates provided on the upper surface of the supporting plate are in contact with the substrate holder;

the plurality of the conductive plates provided on the lower surface of the supporting plate are in contact with the one electrode;

the plurality of the conductive plates provided on the upper surface and the lower surface of the supporting plate are curved into arc shapes; and

the plurality of conductive plates are provided on the upper surface and the lower surface of the supporting plate by attaching one edge and the other edge of each of the plurality of conductive plates provided on the upper surface and the lower surface of the supporting plate to the supporting plate.

6. A plasma CVD apparatus according to claim 1, wherein:

the one conductive member includes a supporting plate provided substantially parallel to the one electrode and a plurality of conductive plates provided on an upper surface and a lower surface of the supporting plate;

the upper surface of the supporting plate is a surface of the supporting plate opposing the substrate holder;

the lower surface of the supporting plate is a surface of the supporting plate opposing the one electrode;

the plurality of the conductive plates provided on the upper surface of the supporting plate are in contact with the substrate holder;

the plurality of the conductive plates provided

on the lower surface of the supporting plate are in contact with the one electrode; and

the shapes of the plurality of the conductive plates provided on the upper surface and the lower surface of the supporting plate are brush shapes.

7. A plasma CVD apparatus according to claim 1, wherein the heater is integrally attached to the one electrode.

8. A plasma CVD apparatus according to claim 1, wherein the one conductive member is attached to the one electrode.

9. A plasma CVD apparatus according to claim 1, wherein the one conductive member is attached to the substrate holder.

10. A plasma CVD apparatus according to claim 1, further comprising a container, and the anode electrode, the cathode electrode, the substrate holder and the one conductive member being included in the container, the one conductive member being attached to an inner surface of the container.

11. A plasma CVD apparatus according to claim 1, further

comprising a tension adjustment member, the one conductive member being attached to the tension adjustment member.

12. A plasma CVD apparatus comprising an anode electrode and a cathode electrode, which is for forming a thin film on a substrate by performing plasma discharge between the anode electrode and the cathode electrode, comprising:

a substrate holder disposed between the anode electrode and the cathode electrode; and

a plurality of conductive members disposed between the substrate holder and one electrode of either the anode electrode or the cathode electrode, wherein

the substrate holder supports the substrate,

the plurality of conductive members are provided in parallel to each other between the one electrode and the and the substrate holder so as to cover a substantially entire space between the one electrode and the and the substrate holder, and

the plurality of conductive members are electrically connected to the one electrode and the substrate holder.

13. A plasma CVD apparatus according to claim 12, wherein shapes of the anode electrode and the cathode electrode

are plate-like shapes.

14. A plasma CVD apparatus according to claim 12, wherein plasma discharge is performed between the anode electrode and the cathode electrode by applying a voltage between the anode electrode and the cathode electrode with a raw material gas supplied between the anode electrode and the cathode electrode.

15. A plasma CVD apparatus according to claim 12, wherein:

the plurality of conductive members include a supporting plate provided substantially parallel to the one electrode and a plurality of conductive plates provided on an upper surface and a lower surface of the supporting plate;

the upper surface of the supporting plate is a surface of the supporting plate opposing the substrate holder;

the lower surface of the supporting plate is a surface of the supporting plate opposing the one electrode;

the plurality of the conductive plates provided on the upper surface of the supporting plate are in contact with the substrate holder;

the plurality of the conductive plates provided

on the lower surface of the supporting plate are in contact with the one electrode;

the shapes of the plurality of the conductive plates provided on the upper surface and the lower surface of the supporting plate are leaf-spring shapes;

the plurality of conductive plates are provided on the upper surface and the lower surface of the supporting plate by attaching one edge of each of the plurality of conductive plates to the supporting plate; and

the other edge of each of the plurality of the conductive plates is spaced from the supporting plate.

16. A plasma CVD apparatus according to claim 12, wherein:

the plurality of conductive members include a supporting plate provided substantially parallel to the one electrode and a plurality of conductive plates provided on an upper surface and a lower surface of the supporting plate;

the upper surface of the supporting plate is a surface of the supporting plate opposing the substrate holder;

the lower surface of the supporting plate is a surface of the supporting plate opposing the one electrode;

the plurality of the conductive plates provided

on the upper surface of the supporting plate are in contact with the substrate holder;

the plurality of the conductive plates provided on the lower surface of the supporting plate are in contact with the one electrode;

the plurality of the conductive plates provided on the upper surface and the lower surface of the supporting plate are curved into arc shapes; and

the plurality of conductive plates are provided on the upper surface and the lower surface of the supporting plate by attaching one edge and the other edge of each of the plurality of conductive plates provided on the upper surface and the lower surface of the supporting plate to the supporting plate.

17. A plasma CVD apparatus according to claim 12, wherein:

the plurality of conductive members include a supporting plate provided substantially parallel to the one electrode and a plurality of conductive plates provided on an upper surface and a lower surface of the supporting plate;

the upper surface of the supporting plate is a surface of the supporting plate opposing the substrate holder;

the lower surface of the supporting plate is a surface of the supporting plate opposing the one electrode;

the plurality of the conductive plates provided on the upper surface of the supporting plate are in contact with the substrate holder;

the plurality of the conductive plates provided on the lower surface of the supporting plate are in contact with the one electrode; and

the shapes of the plurality of the conductive plates provided on the upper surface and the lower surface of the supporting plate are brush shapes.

18. A plasma CVD apparatus according to claim 12, wherein the heater is integrally attached to the one electrode.

19. A plasma CVD apparatus according to claim 12, wherein the plurality of conductive members are attached to the one electrode.

20. A plasma CVD apparatus according to claim 12, wherein the plurality of conductive members are attached to the substrate holder.

21. A plasma CVD apparatus according to claim 12, further

comprising a container, and the anode electrode, the cathode electrode, the substrate holder and the plurality of conductive members being included in the container, the plurality of conductive members being attached to an inner surface of the container.

22. A plasma CVD apparatus according to claim 12, further comprising a tension adjustment member, the one conductive member being attached to the tension adjustment member.

23. A method for forming a thin film on a substrate using a plasma CVD apparatus including an anode electrode and a cathode electrode, wherein

the plasma CVD apparatus includes a substrate holder disposed between the anode electrode and the cathode electrode, and one conductive member disposed between the substrate holder and one electrode of either the anode electrode or the cathode electrode,

the substrate holder supports the substrate, and

the one conductive member is provided between the one electrode and the substrate holder so as to cover a substantially entire space between the one electrode and the substrate holder, and

the one conductive member is electrically

connected to the one electrode and the substrate holder, the method for forming the film comprising the steps of:

(a) supplying a raw material gas between the anode electrode and the cathode electrode; and

(b) performing plasma discharge between the anode electrode and the cathode electrode by applying a voltage between the anode electrode and the cathode electrode.

24. A method for forming a thin film on a substrate using a plasma CVD apparatus including an anode electrode and a cathode electrode, wherein

the plasma CVD apparatus includes a substrate holder disposed between the anode electrode and the cathode electrode, and a plurality of conductive members disposed between the substrate holder and one electrode of either the anode electrode or the cathode electrode,

the substrate holder supports the substrate, and

the plurality of conductive members are provided in parallel to each other between the one electrode and the substrate holder so as to cover a substantially entire space between the one electrode and the substrate holder, and

the plurality of conductive members are electrically connected to the one electrode and the

substrate holder, the method for forming the film comprising the steps of:

(a) supplying a raw material gas between the anode electrode and the cathode electrode; and

(b) performing plasma discharge between the anode electrode and the cathode electrode by applying a voltage between the anode electrode and the cathode electrode.

25. A method for forming a semiconductor device using a plasma CVD apparatus including an anode electrode and a cathode electrode, wherein

the plasma CVD apparatus includes a substrate holder disposed between the anode electrode and the cathode electrode, and one conductive member disposed between the substrate holder and one electrode of either the anode electrode or the cathode electrode,

the substrate holder supports the substrate,

the one conductive member is provided between the one electrode and the substrate holder so as to cover a substantially entire space between the one electrode and the substrate holder, and

the one conductive member is electrically connected to the one electrode and the substrate holder, the method for forming the semiconductor device comprising

the steps of:

(a) supplying a raw material gas between the anode electrode and the cathode electrode;

(b) performing plasma discharge between the anode electrode and the cathode electrode by applying a voltage between the anode electrode and the cathode electrode; and

(c) forming a plurality of thin films on the substrate.

26. A method for forming a semiconductor device using a plasma CVD apparatus including an anode electrode and a cathode electrode, wherein

the plasma CVD apparatus includes a substrate holder disposed between the anode electrode and the cathode electrode, and a plurality of conductive members disposed between the substrate holder and one electrode of either the anode electrode or the cathode electrode,

the substrate holder supports the substrate,

the plurality of conductive members are provided in parallel to each other between the one electrode and the substrate holder so as to cover a substantially entire space between the one electrode and the substrate holder, and

the plurality of conductive members are electrically connected to the one electrode and the substrate holder, the method for forming the semiconductor device comprising the steps of:

(a) supplying a raw material gas between the anode electrode and the cathode electrode;

(b) performing plasma discharge between the anode electrode and the cathode electrode by applying a voltage between the anode electrode and the cathode electrode;
and

(c) forming a plurality of thin films on the substrate.